WASHINGTON
SCIENCE TRENDS

HIGHLIGHTS

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New Military Laboratories

Here is a concise report on new laboratories planned by the military services during the coming year in the field of research, development testing and evaluation. Organizations producing equipment for such facilities may find this report of particular value:

* Watertown Arsenal, Mass: This Army facility plans new physical metallurgy facilities for basic and applied research on ultra-high-strength materials. This is said to require complex experimental equipment and techniques such as x-ray diffraction, internal friction, cyrstallography and devices to study the microstructure of materials.

* Beryllium and uranium research is planned at a new laboratory expected to permit development or refinement of processing techniques to provide ductile beryllium, as well as "urgently" required beryllium alloy. Present ordnance uses of beryllium are said to be limited to non-load-carrying members. It is said that use in load-carrying members, where the full potentials might be realized, requires an intensive period of research and development. The Army has been developing extensive facilities, on a "crash" basis, for atomic weapon components.

* Ft. Huachuca, Ariz.: This Army electronics center plans a new test chamber to house commercial standard altitude, temperature and humidity chambers for the testing of electronic equipment and the study of man-machine relationships under simulated environment at various altitudes.

* Ft. Monmouth, N.J.: New facilities at this Army signal center are planned for nucleonics, including radiation experiments and other special R&D. A climatic test chamber is planned for equipment tests under simulated and actual environmental conditions.

* Ft. Bliss, Tex.: Facilities here will provide new assembly and test equipment for the Hawk Surface-to-Air Missile. A new guided missile maintenance shop for the Corporal, Sergeant and Redstone missiles is also planned.

* Navy Medical Center, Bethesda, Md.: Planned for construction here is large radiation (neutron flux) source incorporating a new reactor design for study of radiation effects peculiar to a nuclear weapon detonation.

Over.....

* Naval Observatory, Flagstaff, Arizona: Construction of an astrometric telescope at an estimated cost of $2 million is planned here. Navy officials say that a recent breakthrough in telescope design now permits greatly accelerated research, and that the proposed 60-inch reflector will represent a gain of accuracy of 3,600 over radio tracking techniques. No known instrument of this capability exists anywhere, according to the Navy.

* Naval Air Development Center, Johnsville, Pa.: A new laboratory here is planned for the qualification, test and evaluation of inertial guidance systems. Need is said to be acute "to ensure manufacturers actually meet the exact specifications."

* Arnold Engineering Development Center: This Air Force establishment, at Tullahoma, Tenn. plans construction of a propulsion engine altitude test cell for testing rocket engine propulsion systems up to 500 thousand pound thrust under simulated altitude conditions.

* Kirtland Air Force Base, New Mex.: A nuclear warfare laboratory is planned here for exploratory research involving new phenomena associated with the detonation of nuclear weapons at high altitudes. The requirements to be investigated relate to the field of induced communications, and radar blackout, kill radii of nuclear weapons, their vulnerability, especially at high altitudes and other special tests.

* Air Force Cambridge Research Center: A plasma physics electronic laboratory is planned at this Bedford, Mass. installation for research in gaseous and plasma physics required to promote development in the performance of electronic and radiation devices.

* Kelly Air Force Base, Tex.: An electronics laboratory is planned here for the testing and fabrication of equipment for the Air Force Security Service, and the Air Force cyrptographic equipment laboratory.

* McClellan Air Force Base, Calif.: A standards calibration laboratory is planned here to provide stability and precise atmospheric conditions for the adjustment of precision instruments. This base has the responsibility for standard calibration and certification of test and calibration equipment utilized on first line aircraft, missiles and the SAGE warning system in this general area.

* Stockbridge Test Annex: This Air Force installation near Rome, N.Y. plans an electronics interference reduction laboratory for the measurement of interferences and the reevaluation of antijam capabilities of receivers.

* Wright Patterson Air Force Base: A polymer research laboratory is planned here for studies of plastics, elastomers, fluids, lubricants, fiber and high-energy propellants which may be used in advanced weapon systems.

* Keesler Air Force Base, Miss.: A new building to house 88 laboratories is planned here in conjunction with a technical training center for maintenance and operational training in electronic data processing and digital and analog computer work. The structure will house approximately $3 million in training devices located at IBM facilities, Kingston, N.Y.

Government Patent Policies

Here is a brief summary of patent policies of some of the major government agencies which deal with Research and Development Contracts as prepared by staff members of the House Committee on Science and Astronautics. These regulations should be considered carefully by any organization seeking Government contracts along these lines:

* Department of Defense: The Department of Defense acquires no patent rights on contracts calling only for delivery of supplies. On research and development contracts the Department requires an irrevocable, royalty-free nonexclusive license to make or have made any invention arising thereunder.

* Department of the Interior: The present policy of the Department of Interior is to attempt to insure that such inventions shall be available to the public by having the patents assigned to the Government. When this cannot be done because of the contractor's refusal to accept an R&D contract with such clause, the exception to the general policy is that title will be left with the contractor, the Government to be granted a royalty-free irrevocable license.

* Department of Agriculture: Research and development contracts are authorized under the Research and Marketing act, which requires that inventions shall be made available to the public through dedication or assignment in the Government. In the event assignment is taken, a royalty-free nonexclusive license is then made available for issuance to qualified persons.

* Department of Commerce: Policy calls for flexibility to allow negotiation as to whether the Government takes title or nonexclusive license. The majority of R&D contracts are financed by the Maritime Administration, within the Department, and are of two categories: (1) entirely marine research-- in which the general policy is to reserve to the Government a nonexclusive royalty-free license or (2) dealing with research bearing on nuclear material or atomic energy in which case the policy of the Atomic Energy Commission is followed.

* Atomic Energy Commission: There are three main alternatives here. The Government can (1) retain sole power for determining and disposing of patent rights, with the contractor retaining no rights; (2) Government retains sole power for determination and disposal and the contractor is allowed at least a nonexclusive, irrevocable royalty-free license; (3) Government retains sole power of determination but contractor is allowed to retain sole irrevocable, royalty-free license except as against the Government.

* Post Office Department: The contractor with the Post Office Department must grant to the Government irrevocable, royalty-free license. However, this is limited to the extent that the Government may not use the license in competition with the contractor or any of its commercial licenses. Although the Government's license is nonexclusive, it may give sublicenses to foreign governments -- solely for use in their mail handling activities.

* Department of Health, Education and Welfare: Basic policy here is that R&D contracts will reserve to the Government the right to determine the ownership and the disposition of any resulting invention. There are two exceptions to this basic policy. The first deals with non-profit institutions where it is determined that the institution will make the inventions readily available without unreasonable restriction or excessive royalty. The contract may provide that the invention will be left to the institution with stipulations in the contract deemed necessary in the public interest. The second exception relates to cancer chemotherapy research contracts with industry, where the contractor may accept the standard patent clause which implements the general policy of the Department -- reserving the right of disposition of inventions to the Surgeon General, or an alternative clause leaving the right to patent inventions with the contractor, subject to certain limitations said to be necessary to protect the public interest. This alternative must contain the provision that there is reserved to the Surgeon General the right to either dedicate the information to the public or to assure royalty-free nonexclusive licenses, notwithstanding any patent which the contractor had previously obtained.

* General Services Administration: GSA follows the Defense Department's procurement policy -- using the contract clause in the Armed Services Procurement Regulations which gives the Government a royalty-free nonexclusive license.

* Veteran's Administration: The VA's usual policy is to provide that the patents remain the property of the contractor -- subject to non-exclusive, irrevocable, royalty-free license to the Government for use and manufacture of the invention for Governmental purposes. In addition, the VA usually acquires the right to reproduce and disclose technical information, drawings, designs, reports and other pertinent data.

* Tennessee Valley Authority: TVA has broad powers to make contracts for R&D work; however there are no such contracts outstanding at the present time. The TVA also has the right to issue grants to non-profit institutions although no regulations covering such grants have yet been issued. TVA at present obtains all of its patents through inventions made by governmental employees. The basic law provides that inventions made by virtue of, and incidental to, employment by an employee shall be the property of the Government. The present policy of the agency is that it now allows title to inventions made by employees which are not "by virtue of and incidental to" the services of employment to remain with the inventor.

  * For further information on patent policies of the various Government agencies and studies of the patent system in general see the publications of the Senate Patent Subcommittee as listed in the Publication Checklist of Washington SCIENCE TRENDS in recent months.

  * For a discussion of present and proposed patent policies of the National Aeronautics and Space Administration see Washington SCIENCE TRENDS, Vol III No. 26, March 14, 1960.

  * For further details write Committee on Science and Astronautics George Washington Inn, Washington 25, D.C. for Hearings and Report Proposed Patent Revisions, NASA. Single Copies Free.

R&D TRENDS

* New Signal Corps Developments: Upcoming Signal Corps developments outlined during the past week by Maj. Gen. R. T. Nelson include an "aerial surveillance platform" to be demonstrated next month said to be capable of producing a radar map with almost the quality of a photograph. Other developments include a mobile radio switching central carried in an Army vehicle which handles up to 48 radio subscriber sets in Jeeps; a push-button telephone; four-wire telephone system featuring a mobile electronic switchboard; a tactical computer weighing no more than 175 pounds and a mobile decision-making complex known as Tactical Operations Central in which visual displays of information and communications means will be centralized. Work is being pressed forward on UNICOM (Universal Integrated Communication System), a concept for a global communications system which will provide personalized service, high-speed automatic switching, and any mode of transmission such as video, data, facsimile, voice and records communications on a completely secure basis -- eventually using communication satellites as repeaters.

* Army Electronic Testing: Army has selected Pan American World Airways, Inc. in a 12-contractor competition for an $18.9 million contract to set up and operate a facility for surveillance drone and electronic environmental testing at Ft. Huachuca, Ariz. Facility is planned for performance and engineering tests on drones and to determine the reaction on each other of new electronic weapons and devices including missile controls, combat television and the like.

* Postdoctoral Fellowships: National Science Foundation has awarded 145 fellowships for advanced study and research in the sciences, mathematics and engineering. Postdoctoral Fellows receive an annual stipend of $4500 plus various allowances. Study or research will be carried on at 26 institutions in the U.S. and 46 abroad.

  (Awards list available. Single Copies Free. Write Information Office, National Science Foundation, Washington 25, D.C. for Release NSF 60-114)

* NASA Contracts: Sentiment is growing in Congress for new legislation which would require the National Aeronautics and Space Administration to submit all proposed large contracts to appropriate Congressional committees for scrutiny and approval before a formal contract is signed.

* Irradiated Fuel Shipments: Atomic Energy Commission wants comment from industry and others on a proposed regulation to guard against accidental criticality, radiation exposure to individuals and the release of fission products during the shipments of irradiated fuel elements. This includes the problem of designing huge casks, expected to cost as much as $100,000 each, and weighing 10 to 70 tons.

  (Written comments and suggestions should be sent to: U. S. Atomic Energy Commission, Washington 25, D.C., Attn: Director of Licensing and Regulation)

* Molybdenum Alloy Development: Navy is emphasizing its interest in the production and rolling of molybdenum alloy sheet which may have application in rockets and missiles. Sylvania Chemical and Metallurgical Division has reached a $356,000 contract for development work. Powder metallurgy techniques will be used to produce sheet in various sizes.

* Project Wagmight: Technical experts of the Navy's Bureau of Weapons this week approved the technical feasibility of Project Wagmight (SCIENCE TRENDS, Dec. 14, 1959) and recommended phase-by-phase development of this long-range missile/aircraft concept. The project was also taken under consideration by the House Military Appropriations Subcommittee.

* Defense Engineering Officials: John H. Rubel, formerly of Hughes Aircraft Co. succeeds Dr. Howard A. Wilcox as Deputy Director of Defense Research and Engineering, Office of the Secretary of Defense. Dr. Wilcox joins General Motors.

* AEC Laboratories: The future of the Atomic Energy Commission's laboratories remains a controversial question in Congress and Industry, These installations now employ approximately 42,000, with an annual operating budget of about two-thirds of a billion dollars, not including weapons work.

AEC has reported to Congress that capacity for performance of new projects at the laboratories will be made available by removing work which has been "brought to the point where it can be carried on by others." As to individual installations:

Argonne National Laboratory, Lemont, Ill. -- moderate expansion of the staff (presently 3,600) is contemplated.
Brookhaven National Laboratory, L.I.N.Y. -- A substantial expansion of effort is anticipated.
Oak Ridge National Laboratory, Oak Ridge, Tenn. Present staff of 5,000 will remain generally stable during the next decade.
Ames Laboratory, Ames, Iowa -- A quite modest increase is anticipated over the coming ten years. Present staff 423.
Lawrence Radiation Laboratory, Berkeley, Calif. -- A major increase from the present staff of 2,200 is envisioned.
Lawrence Radiation Laboratory, Livermore, Calif. -- A slight increase in Pluto work (atmospheric rocket) is forseen. Future increases in Project Plowshare, peaceful uses of nuclear explosions, may occur.
Los Alamos Scientific Laboratory, Los Alamos, New Mex. -- Slow and limited growth may occur if weapons work continues and other anticipated projects develop. Staff now 4,070.
Aircraft Nuclear Propulsion Facility - Evandale, Ohio. AEC says present level of 2,930 appears appropriate.
Bettis Laboratory, Pittsburgh, Pa. -- Personnel cutback from the high of nearly 5000 will continue until a stabilized level somewhat below 3000 is reached. Present total 3,600.
Aircraft Nuclear Propulsion Facility, Hartford, Conn. -- Upward trend expected through Fiscal 1961, after which a stable level should be maintained. Increase would be required in mid-1960's if ground test prototype is to be built.
Sandia Laboratory, Albuquerque, New Mex. - Current level of 7,940 expected to be maintained for early future years. Period following depends upon required weapons program and other work which may be assigned.
Hanford Laboratory, Richland, Wash. - Plutonium manpower may be cut. Reactor and radiation biological work expected to increase. Present staff 1,670.
Savannah River Laboratory, Aiken, S.C. -- Production support work will increase. New assignments, particularly in reactor development, will result in general stable effort. Present total 635.
Knolls Atomic Power Laboratory, Schenectady, N.Y. -- Staff expected to remain at present level of 2,180.

Royalty-Free Patent Checklist

Here is a new listing of Government-owned patents now available for use by industry on a royalty-free basis. Subscribers desiring further information may write Service Department, Washington SCIENCE TRENDS, 1120 National Press Building, Washington 4, D. C.

You will be furnished with the patent number and classification, and information on where to obtain the patent and where to apply for licensing.

( ) Electronic Component Packaging: Space and weight reduction is said to be achieved by this patent which covers an hermetically-sealed package containing tubes, coils and filters for pre-amplifiers and radar equipment.

( ) High-Pressure Pneumatic Cylinder: Fluid seals are used in this pneumatic cylinder which can be employed in shock absorbers, dashpots or other applications where sudden forces are cushioned by the compression of high-pressure gas.

( ) Flame-Resistant Polymers: This patent covers flame-resistant polymers said to be useful in the production of plastics, surface coatings, varnishes and the like.

( ) Dosimeter: This device is said to be constructed so that it can be active at all times, and will record radiation damage following a nuclear attack.

( ) Computer Linkage: This patent covers a precision linkage for exact multiplication and is said to be useful as an element of a machine which performs further computations.

( ) Circuit Closers: This patent includes a switch designed to handle large currents at high speeds. It has a low inductance, and heating and pitting of the contacts is said to be eliminated.

( ) Low-Frequency Amplifier: This patent covers an amplifier said to offer a high impedance to a low-frequency input signal source. It uses a capacitor to interconnect the source of input signals and the control grid of an electron discharge tube.

( ) Slot Closing device: This unit uses negative springs for a slot closure such as might be employed in a turret installation of an aircraft in flight.

( ) Interoffice Telephone: Switches are eliminated in this intercommunication system which includes a number of transducers for both transmitting and receiving sound signals.

( ) Cadmium Battery Plates: This patent covers a method for the manufacturing of cadmium plates for use in batteries of the nickel-cadmium type. Process features the use of polyethylene glycol.

( ) Abrasion Measurement Device: This apparatus measures the abrasion resistance of protective organic coatings on metals.

Publication Checklist

( ) Grants for Scientific Research, a new basic handbook of policies governing the submission of grant applications and the administration of research programs sponsored by the National Science Foundation. 18 pages. Free. (Write Service Department, Washington SCIENCE TRENDS, 1120 National Press Building, Washington 4, D.C.)

( ) Transistorized Power Supplies, a comprehensive literature survey and analysis by the Army's Diamond Ordnance Fuze Laboratories with the emphasis on circuit designs for power convertors, particularly in ordnance electronics. 23 Pages. 75 cents. (Write OTS, U.S. Department of Commerce, Washington 25, D.C. for PB 161 266)

( ) ABMA Transfer, a transcript of hearings on plans for the transfer of the Development Operations Divisions of the Army Ballistics Missile Agency to the National Aeronautics and Space Administration. 41 pages. Single Copies Free. (Write Committee on Science and Astronautics, U.S. House of Representatives, George Washington Inn, Washington 25, D.C.)

( ) German Explosives, Ammunition and Weapons, a one-volume encyclopedia-dictionary prepared in 1958 and now available detailing German developments of World War II. Prepared by the Army's Picatinny Arsenal. 345 Pages. $4. (Write OTS, U.S. Department of Commerce, Washington 25, D.C. for Picatinny Arsenal Technical Report No. 2510)

( ) Polyethylene Film, a new edition of a Commercial Standard covering dimensional tolerances, types, grades, classes and kinds of polyethylene film, intrinsic quality requirements and test methods. 15 cents. (Write Superintendent of Documents, Government Printing Office, Washington 25, D.C. for Commercial Standard CS227-59)

( ) Ordnance Terms, a glossary of terms prepared by the Office of Ordnance Research. Single Copies Free. (Write Mr. George B. Cox, Ordnance Engineering Handbook Coordinator, Office of Ordnance Research, U. S. Army, Box CM, Duke Station, Durham, N.C.)

( ) AEC Research Reports, a new edition of the semi-annual price list of all unclassified reports of AEC research, listing about 5000 documents. Copies Free. (Write OTS, U. S. Department of Commerce, Washington 25, D. C. for AEC Research Reports Price List No. 33)

( ) Helium Plants, technical report on the costs of building and operating the Bureau of Mines' two largest helium plants at Exell, Tex. and Keyes, Oklahoma. (Available for inspection only at Helium Operations Offices, U. S. Bureau of Mines, Amarillo, Texas and Room 4627, Interior Building, Washington, D.C.)

( ) FAA Annual Report, the first annual report of the Federal Aviation Agency outlining plans and programs and highlights of activities during the year. 50 cents. (Write Superintendent of Documents, Government Printing Office, Washington 25, D.C. for FAA Annual Report)